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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/560,130

11/07/2006

Dragan Tubic

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20988 7590 03/19/2008

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EXAMINER

VO, HIEN XUAN

ART UNIT

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2863

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/560,130	<b>Applicant(s)</b> TUBIC ET AL.	
	<b>Examiner</b> HIEN X. VO	<b>Art Unit</b> 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-16, 19 and 20 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 17 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/24/06</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 04/24/06. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 17-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Rioux et al. (U.S. Patent No. 5,946,645) further in view of VanEssen et al. (US Patent No. 6,591,004).

3. With respect to claims 1-2, 17-18, Rioux et al. disclose the three dimensional imaging method and device including obtaining a set of at least one three-dimensional entity and a position for said at least one entity in a common three-dimensional coordinate system, each entity being a set of three-dimensional points, each said point containing at least the three-dimensional coordinates of said point on said target surface, wherein said entity is one of an unorganized cloud, a three-dimensional curve and a range image (see e.g. Figs.

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2-6. col. 2, lines 8-20, col. 4, lines 14-45); constructing a volumetric implicit representation of said target surface in the form of a vector field using said set, each vector in said vector field containing at least the distance to said target surface and the direction toward said target surface (see e.g. col. 5) except for teaching reconstructing said target surface from the information contained in said vector field.

4. VanEssen et al. disclose an automated method for modeling the shape of cerebral cortex and other complex structures using customized filter and transformations including reconstructing said target surface from the information contained in said vector field (see e.g. abstract). Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to include a method for reconstructing surface and analyzing surface of an object as taught by VanEssen in the method and device of Rioux for reconstructing the shape of the image model to provide an apparatus and method to measure surface information using continuous motion rather than in stages, to eliminate complex planning of the operation by the user and the reconstruction reproduces the original pictures accurately, then it is at least likely to reproduce views from nearby viewpoints with similar accuracy.

5. Claims 3-16, 19-20 allowed.

6. The following is a statement of reasons for the indication of allowable subject matter:

7. The primary reason for the allowance of claim 3 is constructing a volumetric implicit representation of said target surface in the form of a vector

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field using a subset of at least one entity of said set, each vector in said vector field containing at least the distance to said target surface and the direction toward said target surface; selecting at least one obtained entity; obtaining a subset of said points on each of said selected entities, points in these subsets being called control points; for each control point in each selected entity, computing a contribution to a cost function, said contribution being a function of at least said vector field and said coordinate of said control point; for each selected entity, computing a new position that optimizes its corresponding cost function; and placing each selected entity in said vector field at its newly computed position and updating said vector field accordingly. It is these limitations found in each of the claims, as they claimed in the combination, that has not found, taught or suggested by the prior art of record which make these claims allowable over the prior art.

8. The primary reason for the allowance of claim 19 is a control point selector for selecting at least one entity used in said vector field; a subset provider for obtaining a subset of points on each of said selected entities, points in these subsets being called control points; a cost function calculator for computing, for each control point in each selected entity, a contribution to a cost function, the contribution being a function of at least the vector field and the coordinate of the control point; a new position calculator for computing, for each selected entity, a new position that optimizes its corresponding cost function; wherein the implicit representation constructor places each selected entity in the vector field at its newly computed position and updates the vector field accordingly. It is these

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limitations found in each of the claims, as they claimed in the combination, that has not found, taught or suggested by the prior art of record which make these claims allowable over the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HIEN X. VO whose telephone number is (571)272-2282. The examiner can normally be reached on M-F (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hien Vo  
03/13/08

/John E Barlow Jr./  
Supervisory Patent Examiner, Art  
Unit 2863

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